UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/549,364	07/17/2006	Makoto Ishida	278285US0PCT	5533

22850 7590 10/22/2007

OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, P.C.
1940 DUKE STREET
ALEXANDRIA, VA 22314

EXAMINER	
QUINTO, KEVIN V	

ART UNIT	PAPER NUMBER
2826	

NOTIFICATION DATE	DELIVERY MODE
10/22/2007	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patentdocket@oblon.com
oblonpat@oblon.com
jgardner@oblon.com

Office Action Summary	Application No.	Applicant(s)	
	10/549,364	ISHIDA ET AL.	
	Examiner	Art Unit	
	Kevin Quinto	2826	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 July 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *6,7 and 12-15* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *6,7 and 12-15* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. The indicated allowability of claims 6 and 7 is withdrawn in view of the newly discovered reference(s) to Pohjonen et al. (USPN 6,242,843 B1), Higuchi et al. (United States Patent Application Publication No. US 2005/0179342 A1), and Ziegler (USPN 6,238,946 B1). Rejections based on the newly cited reference(s) follow.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Pohjonen et al. (USPN 6,242,843 B1) in view of Higuchi et al. (United States Patent Application Publication No. US 2005/0179342 A1) and further in view of Sakashita et al. (United States Patent Application Publication No. US 2005/0040516 A1).

4. In reference to claim 6, Pohjonen et al. (USPN 6,242,843 B1, hereinafter referred to as the "Pohjonen" reference) discloses a similar structure. Figure 7 of Pohjonen illustrates an ultrasonic sensor with a film (130) on a semiconductor single crystal substrate (200). An electrically conductive thin film (110) is on the film (130). A ferroelectric thin film (100) is disposed on the electrically conductive thin film (110). An

upper electrode (120) is disposed on the ferroelectric thin film (100). The semiconductor single crystal substrate (200) is subjected to a treatment for adjusting a resonant frequency and an ultrasonic wave is detected. Pohjonen does not disclose the use of a single crystal material for the electrically conductive thin film or the use of highly oriented ferroelectric film. However the use of such materials is well known in the art. Higuchi et al. (United States Patent Application Publication No. US 2005/0179342 A1, hereinafter referred to as the "Higuchi" reference) discloses that the use of a single crystal platinum film as an electrode in a piezoelectric element is well known in the art (p. 1, paragraphs 2-3) since it leads to the benefit of a well oriented piezoelectric film, in this case the ferroelectric film, PZT. In view of Higuchi, it would therefore be obvious to use a single crystal material for the electrically conductive thin film and a highly oriented ferroelectric film. Furthermore, the applicant is reminded in this regard that it has been held that mere selection of known materials generally understood to be suitable to make a device, the selection of the particular material being on the basis of suitability for the intended use, would be entirely obvious. In re Leshin 125 USPQ 416. Therefore these limitations are not patentable over Pohjonen and Higuchi. Pohjonen does not disclose the use of an epitaxially grown gamma Al_2O_3 film. However the use of this film is well known in the art. Sakashita et al. (United States Patent Application Publication No. US 2005/0040516 A1, hereinafter referred to as the "Sakashita" reference) discloses the use of an epitaxially grown gamma Al_2O_3 film in a ferroelectric structure in order to provide a barrier between the substrate and the electrode film so as prevent a reaction between them as well as to provide the base for orienting the electrode film (p. 4,

paragraph 47 and p. 5, paragraph 54). In view of Sakashita, it would therefore be obvious to use an epitaxially grown gamma Al_2O_3 film. The examiner notes the limitation regarding the use of an epitaxial process to form the Pt thin film. However this places the claim into the form of a **product-by-process claim**:

> Note that a "product by process" claim is directed to the product per se, no matter how actually made, *In re Hirao*, 190 USPQ 15 at 17 (footnote 3). See also *In re Thorpe,* 227 USPQ 964, 966; *In re Luck*, 177 USPQ 523; *In re Fessmann*, 180 USPQ 324; *In re Avery*, 186 USPQ 161*; In re Wertheim*, 191 USPQ 90 (209 USPQ 554 does not deal with this issue); and *In re Marosi* et al., 218 USPQ 289, all of which make it clear that it is the patentability of the final product per se which must be determined in a "product by process" claim, and not the patentability of the process, and that an old or obvious product produced by a new method is not patentable as a product, whether claimed in " product by process" claims or not. Note that applicant has the burden of proof in such cases, as the above case law makes clear. See also MPEP 2113.

Claim 6 is not patentably distinguishable from the Pohjonen, Higuchi, and Sakashita references regardless of the process used to form the Pt thin film, because only the final product is relevant, and not the process of making such as epitaxial growth.

5. With regard to claim 12, the semiconductor single crystal is an Si single crystal (column 3, lines 46-48).

6. In reference to claim 14, Pohjonen discloses (column 3, lines 65-67, column 4, lines 1-4) the use of ZnO, PbTiO3, and $Pb_yLa_{1-y}Zr_xTi_{1-x}O_3$.

7. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Pohjonen et al. (USPN 6,242,843 B1) in view of Higuchi et al. (United States Patent Application Publication No. US 2005/0179342 A1) and further in view of Sakashita et al. (United States Patent Application Publication No. US 2005/0040516 A1) as applied to claim 6 above, and further in view Ziegler (USPN 6,238,946 B1).

8. With regard to claim 7, Pohjonen does not disclose the use of an SOI substrate. However Ziegler (USPN 6,238,946 B1) discloses that the use of an SOI substrate for a

resonator is well known in the art (column 5, lines 17-25). The applicant is reminded in this regard that it has been held that mere selection of known materials generally understood to be suitable to make a device, the selection of the particular material being on the basis of suitability for the intended use, would be entirely obvious. In re Leshin 125 USPQ 416. Therefore claim 7 is not patentable over Pohjonen and Ziegler.

9. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Pohjonen et al. (USPN 6,242,843 B1) in view of Higuchi et al. (United States Patent Application Publication No. US 2005/0179342 A1) and further in view of Sakashita et al. (United States Patent Application Publication No. US 2005/0040516 A1) as applied to claim 6 above, and further in view Tabata et al. (USPN 5,354,732).

10. With regard to claim 15, Pohjonen does not disclose the use of a gold black electrode. However Tabata et al. (USPN 5,354,732, hereinafter referred to as the "Tabata" reference) discloses that gold black is a known electrode material (column 1, lines 17-20). The applicant is reminded in this regard that it has been held that mere selection of known materials generally understood to be suitable to make a device, the selection of the particular material being on the basis of suitability for the intended use, would be entirely obvious. In re Leshin 125 USPQ 416. Therefore claim 15 is not patentable over Pohjonen and Tabata.

11. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Pohjonen et al. (USPN 6,242,843 B1) in view of Higuchi et al. (United States Patent Application Publication No. US 2005/0179342 A1) and further in view of Sakashita et al. (United States Patent Application Publication No. US 2005/0040516 A1) as applied to

claim 12 above, and further in view of Ando et al. (United States Patent Application Publication No. 2004/0021401 A1).

12. In reference to claim 13, Pohjonen does not disclose the use of a (100) face Si single crystal for the growth of the gamma Al_2O_3 film. However the use of a (100) face Si single crystal is well known in the art. Ando et al. (United States Patent Application Publication No. 2004/0021401 A1, hereinafter referred to as the "Ando" reference) discloses that a (100) face Si single crystal is easy to etch and therefore easy to process (p.3, paragraph 47). In view of Ando, it would therefore be obvious to use a (100) face Si single crystal.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin Quinto whose telephone number is (571) 272-1920. The examiner can normally be reached on M-F 8AM-5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sue Purvis can be reached on (571) 272-1236. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

KVQ

EVAN PERT
PRIMARY EXAMINER